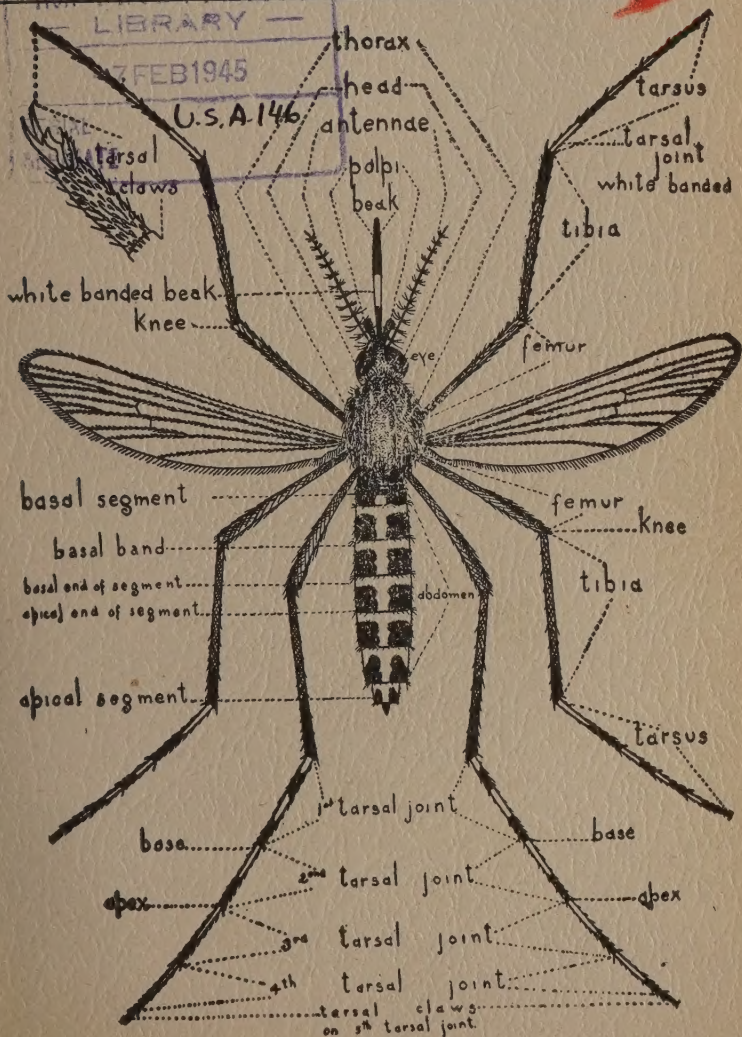


Mosquito News

Issued Quarterly by Eastern Association of Mosquito Control Workers

Vol. 2, No. 4

DECEMBER, 1942



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Thomas D. Mulhern, Secretary
Eastern Ass'n. of Mosquito Control Workers
New Brunswick, New Jersey

ANALYSIS

TOTAL TRAP CATCH
IN RELATION TO TEMPERATURE AND PRECIPITATION

1942

NUMBER OF BROOD	PERIOD OF FLIGHT PERIOD	LARVAL DATA			FLIGHT DATA					GROUP SUMMARY			SEASON													
		DATE OF RAIN	DAYS IN LARVAL STAGE	MAXIMUM TEMPERATURE	MEAN TEMPERATURE	EXTREME TEMPERATURE RANGE	AVERAGE NUMBER CAUGHT PER DAY	MINIMUM TEMPERATURE	MEAN TEMPERATURE	AVERAGE	MAXIMUM NUMBER CAUGHT IN ONE DAY	DATE OF MAXIMUM CATCH	MINIMUM TEMPERATURE	MINIMUM NUMBER CAUGHT IN ONE DAY	DATE OF MINIMUM CATCH	NO. OF DAYS IN FLIGHT RECORD	DAYS RAIN CONTRIBUTING	TOTAL INCHES OF RAIN	AVERAGE MEAN TEMP. OF FLIGHTS	AVERAGE NO. OF MOSQ. / DAY	AVERAGE NO. OF MOSQ. / DAY					
1	JUNE 1	10.5	MAY 14	89	72.3	54.8-83.3	47.78	5	79.5	83.1	70.9	14	JUNE 10	7.6	8.0	0	JUNE 1	7.4	1	4	1.6	1.46	0.25	80	89.1	3
2	JUNE 16	6	0.3	JUNE 5	15	70.7	60.3-80.5	60.35	10	75.6	89.4	59.1	2.5	JUNE 19	8.0	8.6	9	JUNE 17	7.0	8.9						
3	JUNE 22	4	4.0	JUNE 8	19	79.2	61.3-87.1	50.46	41	76.6	57.2	83.0	61	JUNE 28	8.4	8.6	JUNE 28	8.2	6.4							
4	JUNE 25	0.16	JUNE 14	12	77.9	68.7-83.3	83.36	32	75.5	56.2	83.9	44	JUNE 28	7.6	8.3	16	JUNE 30	7.9	8.9							
5	JUNE 30	0.09	JUNE 17	13	77.4	60.1-82.6	82.63	23	79.4	83.5	71.5	40	JULY 3	8.5	8.5	4	JULY 9	8.0	5.8							
6	JULY 1	0	10.4	JUNE 21	13	77.4	60.1-82.6	82.63	23	79.4	83.5	71.5	40	JULY 3	8.5	8.5	4	JULY 9	8.0	5.8						
7	JULY 4	0	0.20	JUNE 23	15	83.3	63.9-84.7	52.43	10	77.9	86.5	88.9	13	JULY 11	7.0	6.4	7	JULY 13	8.2	5.6						
8	JULY 10	4	0.04	JUNE 27	15	83.3	63.9-84.7	52.43	10	77.9	86.5	88.9	13	JULY 11	7.0	6.4	7	JULY 13	8.2	5.6						
9	JULY 13	0.16	JULY 1	14	78.2	62.6-79.0	56.65	32	81.6	83.7	72.7	36	JULY 14	6.5	7.0	29	JULY 16	8.0	5.4							
10	JULY 19	1.16	JULY 2	14	78.2	62.6-79.0	56.65	32	81.6	83.7	72.7	36	JULY 14	6.5	7.0	29	JULY 16	8.0	5.4							
11	JULY 20	3	1.33	JULY 4	15	80.9	61.7-71.8	54.93	74	86.0	67.7	75.6	77	JULY 21	8.6	8.8	31	JULY 20	8.0	6.9						
12	JULY 28	4	1.36	JULY 11	15	81.8	69.7-72.3	54.93	85	81.5	82.5	72.0	87	JULY 28	8.4	6.0	20	JULY 28	8.3	8.2						
13	JULY 29	0	0.84	JULY 18	10	82.7	62.7-76.2	57.83	65	80.6	87.0	73.9	62	JULY 27	7.8	7.5	36	JULY 31	7.5	5.9						
14	AUG. 1	0.39	JULY 27	9	81.9	66.5-73.7	58.67	42	78.4	83.6	83.5	28.1	AUG. 4	7.9	8.6	93	AUG. 9	7.3	5.4							
15	AUG. 10	0.10	JULY 28	9	81.9	66.5-73.7	58.67	42	78.4	83.6	83.5	28.1	AUG. 4	7.9	8.6	93	AUG. 9	7.3	5.4							
16	AUG. 10	0.03	JULY 28	9	81.9	66.5-73.7	58.67	42	78.4	83.6	83.5	28.1	AUG. 4	7.9	8.6	93	AUG. 9	7.3	5.4							
17	AUG. 13	4	0.89	JULY 31	12	78.0	60.5-68.8	54.87	18.1	76.5	87.5	73.0	20.8	AUG. 11	8.1	8.8	112	AUG. 13	7.7	5.9						
18	AUG. 13	6	1.89	AUG. 9	10	78.6	66.0-73.6	64.62	19.4	80.5	86.1	74.6	23.5	AUG. 18	8.0	6.6	93	AUG. 19	8.3	5.9						
19	AUG. 19	7	8.31	AUG. 13	9	81.8	64.0-74.7	59.90	37.9	80.0	81.3	70.7	80.6	AUG. 31	8.0	7.1	60	AUG. 26	7.8	5.7						
20	AUG. 20	0.22	AUG. 14	9	81.8	64.0-74.7	59.90	37.9	80.0	81.3	70.7	80.6	AUG. 31	8.0	7.1	60	AUG. 26	7.8	5.7							
21	AUG. 27	0.23	AUG. 17	18	86.1	80.9-73.4	47.40	18.6	74.3	51.6	83.0	25.3	AUG. 26	7.5	8.2	70	AUG. 31	7.4	4.5							
22	SEPT. 1	0.48	AUG. 16	6	86.1	80.9-73.4	47.40	18.6	74.3	51.6	83.0	25.3	AUG. 26	7.5	8.2	70	AUG. 31	7.4	4.5							
23	SEPT. 9	0.83	AUG. 24	15	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
24	SEPT. 14	0.44	SEPT. 14	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
25	SEPT. 24	0.32	SEPT. 15	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
26	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
27	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
28	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
29	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
30	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
31	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
32	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
33	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
34	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
35	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
36	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
37	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
38	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
39	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
40	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
41	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
42	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
43	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
44	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
45	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
46	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
47	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
48	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
49	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
50	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
51	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
52	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
53	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6	7.1	8.2	58	SEPT. 9	6.7	6.1							
54	SEPT. 30	0.40	SEPT. 21	9	78.1	60.7-65.9	54.47	12.7	76.9	86.6	65.6	19.7	SEPT. 6													

EDITORIAL COMMENT

Striving to fill an expressed need of many mosquito control workers for a regular clearing house of information on mosquitoes and their control, Mosquito News is being recognized as a boon to workers in this field all over the country. This medium for collecting and disseminating information has found a niche in the magazine field, hitherto unoccupied. Up to the present time, the material has been furnished by contributors on subjects which the contributors considered interesting and informative or on subjects deemed apropos by the chairman of the publishing committee.

To-day, the mosquito control worker is faced with many additional problems that were not present before the war. Some of the few which are most baffling at times are rationing, priorities and shortages of labor and materials. Contributions from anyone on such problems will be most welcome. A helpful Washington official, an unrationed substitute, or a new source of helpful labor may mean the prevention of a brood of pest mosquitoes or an epidemic of malaria. So get out the old typewriter and write of your solution to to-day's problems or send a request for an article on some problem which is troubling you. We will try to locate a writer to prepare an answer for you.

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EASTERN ASSOCIATION OF MOSQUITO CONTROL WORKERS

Inspection of Mosquito Control Work in Northeastern New Jersey, followed by a meeting of the Association, held on November 6, 1942.

Sixteen members of the Association and 15 guests were present during the inspection, and 16 members and 5 guests attended the meeting. Altogether there were representatives from New York, New Jersey, Delaware, the U. S. Public Health Service and the U. S. Army.

The group assembled at the Pennsylvania Railroad Station in Newark, leaving that point at 9:15 A.M. Inspections were made in Essex, Bergen, and Morris Counties, as detailed below. Lunch was at the Elk's Club in Hackensack, and dinner followed by the meeting took place at the Chanticleer Restaurant in Millburn.

Inspections in Essex County

They were shown the twelve inch pump in operation. This pump drains 286 acres in the Ebling Meadow. The ground looked over work being done by the Bucyrus-Erie excavator. This machine has a 3/8 yard orange peel bucket. They finished the inspection at the new hydraulic fill. This fill was completed on October 15th, 1942.

Inspections in Bergen County

1 - North Arlington view of Hudson and Bergen County Meadow (2000 acres) from bluffs along Schuyler Avenue. Outline of East section of meadow obscured by fog.

2 - East Rutherford. Inspection of recently completed overhaul job of drainage ditch by 1/2 yd. shovel. Length 1500 ft. 18 ft. by 6 ft. outlet into Berry's Creek. Through railroad culvert, flap gates attached to culvert wall act as tidegates.

3 - Inspection of equipment used in Bergen County including new mole attachment for Salt Hay Meadow drainage. This unit was described by Mr. Sammis of Nassau County, N. Y. who has operated similar units on Long Island.

4 - Lunch at Elk's Club, attendance 32. At this point Mr. J. B. Leslie of Bergen and Mr. John Flynn joined the party. Press representative of Bergen Evening Record attended luncheon.

5 - Inspection of ditch improvement. Eckle's Creek, Little Ferry. Using Bucyrus-Erie 3/8 yd. Dragline increasing size of ditch from 8 ft. by 4 ft. to 20 ft. by 6 ft. Machine working down stream to tidegate at Hackensack River rather than upstream; Reason - saving of approximately three miles on return trip. Machine will be used on reconstruction of dike after reaching tidegate. Disadvantage of downstream work. Building up of water head in front of machine, gathering of debris, floating grass, etc.

6 - Completed tidegate (4 boxes), Riser Ditch System. Dike and gates provide drainage for 1500 acres of highland comprising drainage area. Due to schedule the East Riser section of this project (now under construction) was not inspected.

Inspections in Morris County

The first stop in Morris County was at Beattie's Dam. At this point, a brief explanation was given by James T. Hart, Jr., Ass't. Supt. regarding mosquito breeding in the area above the dam (some 26 miles) known as the Passaic Valley. This area, subject to flood during heavy rainfall, consists of some 18,000 acres. The next stop was at Pine Brook where the group was shown the Dragline and the 10" Hydraulic Dredge operated jointly by the Essex and Morris County Commissions. Here the group was able to view the dredge in operation and was able to see the river condition before and the river after dredging. Due to the late hour

after dredging operations were viewed, the trip to Pica-tinny Arsenal was cancelled and the group proceeded to Millburn where the meeting of the Association was to be held.

Meeting

The meeting was called to order at 7:30 P.M. by Mr. Robert L. Vannote. (The President, Dr. L. A. Stearns has resigned to take a commission as a Major in the U. S. Army, and word had been received from First Vice President, Robert Botsford, that he could not be present because of illness.)

Members present - Dr. Glasgow, Mr. Sammis, Mr. Vannote, Mr. Flynn, Mr. Eager, Mr. Stivers, Mr. VanDerwerker, Mr. Smith, Mr. Thom, Mr. VanNote, Mr. Henderson, Dr. Headlee, Dr. Ginsburg, Mr. Mulhern, Mr. Lynch, Mr. Gies.

Guests Present - Mr. A. A. Kahn, Seacost Laboratories, New York; Dr. John B. Schmitt, N. J. Agrl. Expt. Station; Mr. Herman Hegwald, Hudson County Mosquito Extermination Commission; Mr. G. C. deRoth, Union County Mosquito Extermination Commission; and Dr. Paul L. Rice, Delaware Agricultural Experiment Station.

Secretary's Report

The secretary's report was presented giving a review of the year's trips and meetings.

Treasurer's Report

The treasurer reported the extension of membership to include workers from California, Illinois and Louisiana as well as the original Eastern Seaboard States. During the year 1942 dues have been collected from 32 active and 21 associate members. On the present date, there exists

favorable balance of \$120.20 in the treasury. There are no outstanding obligations, and accounts receivable in the form of unpaid dues and bills for advertising in the most recent issue of Mosquito News will when paid further improve the present favorable balance.

Publications Committee

Mr. VanDerwerker Reported as chairman of the Publications Committee that 3 issues of Mosquito News had been printed and distributed during 1942, and the last issue of the year will go to press shortly after November 10. There is a steadily growing demand for the publication, and its distribution has accounted for several new applications for membership. Advertising in the book has been sold, and while still not entirely self supporting, the costs to the Association have been much reduced. The issues have grown larger, and a number of very interesting contributions have been printed. A number of favorable comments have been received, and the publication seems to fill an important place in the mosquito literature.

Meetings and Annual Tour Committee

Mr. Smith reported for the committee. He called attention to the impracticability of arranging any inspection that would involve auto travel. He cited the Norfolk inspection, to which the members came by train, as the only type of inspection that could be planned. The Illinois mosquito work is probably the most interesting possibility, and a very well worth while inspection could probably be arranged. Mr. Vannote called attention to the development of very effective spraying machines by the Desplaines Valley Mosquito Abatement District, and there was evidence of considerable interest in the work being done there. Because of the war emergency and the uncertainty of transportation it seemed however, to be impracticable to arrange at this time for an inspection of this work.

Committee on Circulation of Mosquito News

Dr. Glasgow reported as chairman of this committee. A considerable amount of thought and preliminary planning has been engaged in by the committee. Mosquito News is a venture in a field not at present served by any publication. It is receiving wide approval and the interest of mosquito workers throughout the country. It now seems wise to consider future policies, and whether it should be made to appeal generally to mosquito workers, or primarily to the original group. If any changes are to be made, they should be effective by the time the first 1943 issue is printed. The present committee has done an excellent job, but as organized at present, getting out the book imposes an unfair burden on a few men. A number of changes might be made to spread the work, and to provide for continuing editorial policies, to continue the present high standard of the book even though the editorial staff may change. The committee was encouraged to complete its work and to prepare, as soon as practicable, written recommendations in order that the future policy may be considered and definitely decided upon.

1943 Officers

The Executive Committee for 1943 was elected prior to the meeting by letter ballot, as follows:

Mass. - Edward Wright; R. I. - Milton Price; Conn. - Robert Botsford; New York - Edward Butchard; New Jersey - Lester Smith; Penn. - J. F. Conner; Delaware - E. E. Lynch; Virginia - R. E. Dorer; U. S. Gov't. - Dr. F. C. Bishopp.

Inasmuch as there were a number of states not represented at the meeting, it was decided that the officers for 1943 should also be elected by letter ballot.

WORLD-WIDE MOSQUITO CONTROLSalt Lake City Finds Pyrethrum Larvicide
Effective as a Repellant on Outdoor Gatherings.

Don M. Rees, President
Board of Trustees
Salt Lake City Mosquito
Abatement District
Salt Lake City, Utah

During 1942 mosquito control work in the Salt Lake City Mosquito Abatement District has been very effective. Mosquitoes were annoying at times in certain localities, but in each instance the source of the trouble was almost immediately determined and the nuisance abated.

This season considerable difficulty was experienced in obtaining the necessary help for field work. As a result, a greater number of students from the University of Utah were employed, after a substantial increase was provided in the wage scale. This student help under the direction of a few experienced employees did very excellent work. In fact, their work was more satisfactory than the work of some of the older men who have quit mosquito control work for more lucrative jobs.

Difficulties were also experienced in obtaining transportation, materials and equipment. To date, we have been unable to purchase or rent equipment for cleaning major drains, or even to get a contractor to submit a bid for the job.

The Army has assisted to some extent in mosquito control work in certain military areas. This work was rather sporadic, probably due to the change in personnel, and on several occasions large broods of mosquitoes escaped in these areas, creating not only considerable annoyance in the military zones but also to residents of the city adjacent to these areas. This was especially true in one closed area where city mosquito abatement employees were not permitted to enter.

During the season, pyrethrum larvicide was used almost exclusively in the residential sections of the city with very satisfactory results. In addition, pyrethrum spray was used to protect people from mosquitoes at numerous outdoor gatherings. This service was started at the request of the City Parks Department to protect the people attending concerts, operas, etc., held each Friday evening in the outdoor theatre at Fairmont Park. The results were so effective, psychologically or actually, that the service was insisted upon and continued throughout the season.

An illustrated 34-page "Informative Bulletin on Mosquito Abatement in Salt Lake City" was published and distributed in 1941 to all schools, libraries, reception and reading rooms throughout Salt Lake City and vicinity. This bulletin has exceeded all expectations in creating interest and gaining public support for mosquito abatement work in Utah.

A technical bulletin, "The Mosquitoes of Utah", is now in press and will soon be available in the Biological Series of the University of Utah. This bulletin provides suitable keys for classification, also the known distribution, life history, habits and economic importance of the thirty-one species listed in the state.

Total expenditures, for the period starting December 1, 1941 and ending November 1, 1942, amounted to \$20,718.13.

California Mosquito Control Helps War
Industries and Military Establishments

Harold F. Gray, Engineer
Alameda County Mosquito
Abatement District
Oakland, California

During 1942 California, because of its strategic position and its great number of war industries and military

establishments, has concentrated largely on mosquito control measures of direct assistance to military establishments. The tremendous influx of war plant workers and military personnel has brought some large and difficult problems.

One new district has been organized in Fresno County in 1942, and is beginning work. Additional territory was also annexed to the Dr. Morris District in Kern County.

Up to April 1, 1942, the U. S. Public Health Service sponsored projects in San Diego County, Los Angeles and Orange Counties, San Luis Obispo and Monterey County (fresh water). The work consisted of drainage and clearing, with some incidental oiling, in areas not without organized mosquito abatement districts.

Beginning September 1, 1942, entomological and inspection work was undertaken by the U. S. Public Health Service, with one man each assigned to Tulare County, Merced and Stanislaus Counties, and Yuba County. Actual work, mainly oiling, with some minor drainage and clearing, has been done in Tulare County and Merced County, using three crews of four men each. This work has been strictly anti-anopheline work, and confined to a radius of about one mile surrounding military establishments.

The Bureau of Sanitary Engineering of the California State Department of Public Health has been handicapped in its supervisory work, since its mosquito control officer, Richard Peters, was commissioned a lieutenant in the Sanitary Corps Reserve, U. S. Army. Professor Stanley B. Freeborn has been commissioned in the U. S. Public Health Service Reserve as Malariologist with the rank of Senior Surgeon, and after spending some two months on work in California, is now in Georgia.

The districts around San Francisco Bay have been cooperating closely with the many army and navy establishments in this area. At some posts the districts, on request, are doing the actual control work; in others they

are furnishing technical advice or special services only. Many of the districts are having extreme difficulty in maintaining adequate crews, partly due to the draft, but mainly to the competition of high paid jobs in shipyards and other war industries.

The Alameda County Mosquito Abatement District, in cooperation with the University of California, has been assisting in the training of Navy Medical Corps personnel who are en route to stations in the combat areas in the Pacific. Both laboratory demonstrations on mosquito identification and other techniques, and practical field experience in mosquito control methods, as they must be modified for tropical areas, are being given these men.

Some reports have been received that oils of low toxicity have been in some cases substituted for the highly toxic Diesel oil heretofore furnished. This problem may become increasingly important later. Two districts have experimented with aliphatic thiocyanates as substitutes for pyrethrum as the toxic element in larvicides, but with unsatisfactory results. Difficulties in obtaining pyrethrum concentrates, and their high price, may result in the abandonment of pyrethrum larvicides in favor of the use of oil, in the few districts now using larvicides.

The year 1942 was expected to be a year of high incidence of encephalitis in the central valley of California, but instead, relatively few (43) and scattered cases appeared, in spite of a large influx of presumably susceptible persons into the endemic areas. Intensive work against Culex tarsalis and Culex pipiens (var. molestus), which are now practically proven to be vectors, may have contributed to this result. An increase in malaria incidence was also expected, due to large migrations from endemic areas of the southern states, but instead there was a decrease in reported cases, with no indications of increase in unreported cases. Neither dengue nor filariasis have yet been reported, though epidemics in the south

ern part of the state may be expected to occur later when military personnel infected in the Pacific theater of war is returned to this region.

On account of transportation difficulties and pressure of war work, it appears probable that the 1942 meeting of the California Mosquito Control Association will not be held.

ACTIVITIES IN MEMBER STATES

Malaria Control Anticipated for Maryland

Dr. Ernest N. Cory,
State Entomologist
University of Maryland
College Park, Maryland

The U. S. Public Health Service has recognized that conditions in Maryland might result in an outbreak of malaria, and in consequence have extended their project on the "Control of Malaria in War Areas" to include Maryland. The administration of this project is under the State Department of Health, and the State Entomologist is responsible for the reconnaissance surveys and the supervision of the entomological work in checking up on the effectiveness of the work being done. All this work is done in the immediate environs of military and naval installations, defense plants, and defense housing projects. There are a large number of installations in Maryland and a number of the projects were begun during the late summer of 1942, and it is anticipated that all of the projects will be activated next spring.

Suffolk County Mosquito Extermination Commission Correlates the Weather and Mosquito Trap Catches.

Robert D. Gill, Sr.
Engineer and Entomologist
Suffolk Co. Mosq. Ext. Comm.
Yaphank, L. I., N. Y.

(Due to our system of publishing, the accompanying

chart had to be placed at the front of "Mosquito News".)

The record of the trap catch of mosquitoes shows the fluctuation of the number or prevalence of mosquitoes but it does not always clearly explain to the layman why these numbers go up or down and does not readily interpret the intervening larval span, or highlight the latter's importance in regard to control effort.

In many cases people who support various Commissions, praise or condemn the Commission for the amount of mosquito annoyance, rather than the efficiency of control exerted per dollar available in the budget.

These people are not apathetic to effort in the direction of mosquito control but do not realize that while the budget is a fixed amount, weather is not, and to a large extent determines the relative amount of control possible to obtain from a dollar. It really determines that the spread of the budget when fixed, may be generous one year and totally inadequate the next.

Therefore, an analysis of the season's trap catch was made. It traces a portion of the history of each brood of mosquitoes throughout the season. It shows not only the prevalence of mosquitoes but the most important conditions pertaining thereto. By taking into account the number of rains within each larval span, it often demonstrates the inability of the spray crews to cover a territory allotted on their ability in a normal year to cover the entire territory once during each larval period or between succeeding rains.

Supplementary Information Analysis of Total Trap Catch

Mosquito Commissions should be judged by their efficiency of control in regard to money available rather than upon the prevalence of mosquitoes.

In any reference to conclusions drawn from the analysis of the trap catch it should be borne in mind that while the basic idea relative to the details shown on the chart has been forming over a period of five years, this is the first time any attempt has been made toward the correlation of it, and as time goes on and more information is available more definite results may or may not be shown, and the value of such a record more, or less, clearly indicated.

It is the inclination of the author of the analysis to believe that for any given uncontrolled locality, the prevalence of mosquitoes under forces exerted by nature, may be predetermined to a marked degree by examinations of that locality in regard to natural forces; namely; location, temperature, amount and distribution of precipitation, and the size of the preceding brood together with a potential egg crop. Other factors of course enter the picture, the most important in coastal areas being - humidity, wind, and periodic spring or neap tides. This effect could be determined, but to some extent levels out under a record based upon a number of preceding years.

In this same manner the prevalence of mosquitoes under a definite amount of control may be prognosticated for a given locality under given conditions. When records are compared with those of an uncontrolled area, a control ratio might be set up. In case the records were not available and the budget was a fixed yearly amount, the periodic comparison of the same area under groupings of similar natural conditions would allow the setting up of empirical formulas for the expected number of mosquitoes.

When the latter were compared with the actual number present, a relative efficiency of control could be demonstrated. This would be the yard stick for the season's performance and when compared with the budget should show the effective control obtained per dollar. Any discrepancy in the season's catch should be explainable, in the

light of the chart of the total trap catch analysis.

KEY

Sources of Information, U.S. Department of Commerce, Weather Bureau, Climatological Data.

Record of the Bi-Weekly Trap Catch of Mosquitoes in Suffolk County, N. Y. for the Month of June to September, Inclusive.

All temperatures are in degrees Fahrenheit. Maximum and minimum temperatures are averages of the maximum or minimum daily temperatures for the appropriate span.

In larval data this includes from the initial date of rain pertaining to a given brood until the date of maximum catch of the same brood.

In flight data it includes data for the dates of the "Peak of the Flight Period" inclusive.

The "Maximum or Minimum Daily Catch" is a weighted daily mean of the bi-weekly catch.

The "Group Summary" is divided on the basis of roughly similar groups, i.e. when the larval span is of approximately the same number of days, and when the flight is at similar conditions of temperature and precipitation.

The "Days in Larval Stage" or "Average Number of Days as Larvae" may be shorter than the number of days indicated. There is a time lag between the time mosquitoes start to fly and the time they are trapped. Further the period shown on the chart includes to the date of maximum and not initial catch. This fact should be borne in mind in assessing the difficulties of control or in predicating

territory to be covered within a given time by control crews.

The "Season" is the net result of all groups and although it will differ greatly from year to year should be explainable in the group summary, and from there can be traced back to an individual group and brood.

In the "Group Summary" the mean minimum temperature of flights is used rather than the arithmetical mean of the maximum and minimum. The reason is that when there is a sharp drop in daily temperature there is also a sharp drop in the daily trap catch. On some occasions the maximum goes up on the same day and the mean of the two is not so reliable for an index of the daily catch. This seems to be so in a temperature zone such as Long Island. However, in tropical climates the reverse picture might hold and the maximum temperature found more reliable. In any event it is a matter of convenience and common sense on the part of the person making the analysis.

DEVELOPMENTS IN MOSQUITO CONTROL
Even the Oyster Becomes Fatter and
Fatter After Mosquito Control Ditch-
ing is Installed.

Dr. Thurlow C. Nelson,
Biologist

N. J. Oyster Research Laboratory
Rutgers University,
New Brunswick, N. J.

A generation ago there was a good market for salt hay and the conical brown stacks of dried marsh grass were a familiar sight on New Jersey marshes. Within recent years there has been a great reduction in the harvesting of salt hay, hence with the loss of much of this one crop obtainable from our salt marsh these areas are now considered as pretty much a liability. Studies made in 1921 and 1922 by R. G. W. Martin at the New Jersey Oyster Research Laboratory of the Agricultural Experiment Station showed for the

first time that vast quantities of food of value to the oyster grows in the salt ponds and upon the wet surface of our tidal marshes, (Martin, G. W. 1923; "Food of the Oyster" Bot. Gaz. 75:143-169). Since no ditching had been done in this area at that time these large food supplies on the marsh were made available to the oyster only after hard rains or storm tides. Dr. Martin found at Barnegat by repeated examinations of the oyster's stomach contents that after heavy rains the diatoms and other food organisms characteristic of the offshore oyster beds were almost wholly replaced by plant organisms which thrive in the salt pond and upon the surface of the marsh.

Reporting to the New Jersey Mosquito Extermination Association (Proceedings for 1934; 149-152: 1935; 142-144) Dr. T. C. Nelson stressed the possible use of enclosed basins or claires cut in the marsh for fattening oysters as is done in France. The role of the salt marsh in furnishing food to the oyster was further emphasized.

The vast marshes adjoining the Mullica River have ever been one of the great mosquito breeding grounds in New Jersey. Through these marshes flows the largest river in the state to spread out into Great Bay. From the iron bridge which crosses the river on Route 4, 9 to the new Inlet lies a prosperous oyster and clam industry. Like these industries in other localities the Mullica-Great Bay areas have had their ups and downs. During the early boyhood of the writer one could almost walk from boat to boat across the mouth of the Mullica River on the opening day of the oyster tonging season. There followed a steady decline resulting from excessive tonging on the natural oyster beds and removal of shells.

Within recent years, however, there has been a steady improvement in the industry especially in the quality of the oysters which now rank among the very finest produced in New Jersey. Through enlargement of the inlet, which followed a heavy storm in 1919, the tidal rise and

fall has so increased that the average high tide now floods much of the surrounding marsh. Ditches cut through this marsh within recent years carry these flood tide waters to all parts of the marsh and as quickly drain them again as the tide falls.

The microscopic plant life which comprises the food of the oyster needs the inorganic nutrients required by all plants and which are furnished by the marsh. This oyster food also needs sunlight which it receives in abundance in the thin film of water which spreads over the marsh at high tide. Since the extent of the salt marshes is vastly greater than the surface of the Mullica River and of Great Bay combined there is thus created a great accessory garden for the growing of oyster food with the ditches furnishing a means of rapid transport of this food down to the oyster beds. This is important for some of these food organisms are very delicate and will not long survive the change from the shallow warm and brilliantly lighted marsh surface to the cooler, darker depths of the river.

Just how important this contribution from the marshes may be can only be determined by an extensive study of the water entering and leaving the mosquito ditches. Preliminary observations indicate that this source of food at certain times of the year at least may be very great. Recent investigations by the U. S. Fish and Wild-life Service and by the Oyster Research Laboratory show the marked stimulating effect of commercial fertilizers on diatom growth. It is possible that such fertilizer spread upon the marsh might greatly increase the food resources of nearby tidal creeks.

When we appreciate that one species of diatom in a year brought additional income of nearly a million dollars to the oyster industry of Delaware Bay it is obvious that here is a field of research which will yield rich returns. The greatest salt marsh areas in New Jersey are those of the Mullica just mentioned, and those lying

between the lower Tuckahoe and Great Egg Harbor Rivers adjacent to Great Egg Harbor. Both areas contain valuable oyster beds. It is possible that the cost of ditching and draining of these marshes may be in part compensated by an appreciable return through better and fatter oysters, wholly distinct from the benefits of mosquito destruction.

Cyanide Versus Paradichlorobenzene As
A Killing Agent in Mosquito Light Traps

H. H. Stage

U. S. Dept. of Agriculture
Agricultural Research
Administration

Bureau of Entomology and
Plant Quarantine

The ever-present danger of hydrogen cyanide in light traps and the need of a killing agent more easily managed than cyanide in the newly designed automatic traps prompted comparison of this poison with paradichlorobenzene during the summer of 1939. Accordingly, two traps were set up 50 feet apart near a typical breeding area on Lotus Island in the lower Columbia River, near Portland, Oregon, where satisfactory samples of the mosquito population had been taken in former years. The east trap was somewhat more protected by surrounding brush than was the west trap, and because they were placed on opposite sides of a bridge each trap was out of range of the other's light.

The two poisons were alternated in the traps six times. Hydrogen cyanide was used a total of 62 nights, 35 nights in the east trap and 27 nights in the west trap, and paradichlorobenzene was used a total of 64 nights, 28 nights in the east trap and 36 nights in the west trap. Each trap was operated a total of 63 nights. Comparisons of nightly collections were then made both between the two positions and between the two poisons. The results are summarized in the accompanying table.

COMPARISON BETWEEN POISONS

Species	Cyanide		Paradichlorobenzene	
	Total Insects Caught	Nightly Mean	Total Insects Caught	Nightly Mean
<u>Aedes vexans</u> (Meig.)	164	2.6	195	3.0
<u>Aedes lateralis</u> (Meig.)	26	0.4	43	0.7
<u>Culex pipiens</u> L.	662	10.7	722	11.3
<u>Culex tarsalis</u> Coq.	277	4.5	321	5.0
<u>Anopheles</u> <u>punctipennis</u> (Say)	66	1.1	51	0.8
<u>Anopheles</u> <u>maculipennis</u> Meig.	45	0.7	44	0.7
<u>Theobaldia</u> spp.	9	0.1	8	0.1
Males	229	3.7	305	4.8
Females	1020	16.5	1079	16.9
Total	1249	20.1	1384	21.6

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Mosquito News

COMPARISON BETWEEN TRAPS

Species	East Trap		West Trap	
	Total Insects Caught	Nightly Mean	Total Insects Caught	Nightly Mean
<u>des vexans</u> (Meig.)	170	2.7	189	3.0
<u>des lateralis</u> (Meig.)	38	0.6	31	0.5
<u>lex pipiens</u> L.	742	11.8	642	10.2
<u>lex tarsalis</u> Coq.	285	4.5	313	5.0
<u>opheles</u>				
<u>nctipennis</u> (Say)	48	0.8	69	1.1
<u>opheles</u>				
<u>culipennis</u> Meig	27	0.4	62	1.0
<u>neobaldia</u>				
spp.	7	0.1	10	0.2
les	229	3.6	305	4.8
males	1088	17.3	1011	16.0
Total	1317	20.9	1316	20.8

It appears from the table that little difference existed in the use of the poisons or in the position of the traps. For example 20.9 mosquitoes (mean number) were collected nightly in the east trap, compared with a mean of 0.8 mosquitoes collected nightly in the west trap. Also, 11.8 mosquitoes (mean number) were collected nightly when paradichlorobenzene was used, as against a mean of 20.1 mosquitoes nightly when cyanide was used. It is also apparent that the sex ratio as well as the species ratio is reasonably comparable for both poisons and both traps.

In localities where large numbers of night-flying insects occur, cyanide, however, may be the preferred poison because of its comparatively fast-killing properties.

MALARIA CONTROL verses MOSQUITO CONTROL

Perry W. Ruth

Bureau of Mosquito Control

Dept. Public Welfare

City of Norfolk, Virginia

The proposition that the health of our boys in all branches of the service must be protected in every way possible is only common sense and is equally important with respect to those in all defense work. Health, morale and efficiency are three very essential elements in the building of any army of fighting men or workers and the third element is greatly dependent on the first two. It is generally realized that malaria can break through the defenses of the healthiest individuals and so drain their physical stamina as to render them almost useless. The reservoir of malaria infection in our southern states is large and the responsibility thrown upon mosquito organizations of many districts was heavy. We were, therefore, all glad to learn that the fight against malaria had been taken over by the U. S. Public Health Service under the direction of Dr. L. L. Williams, having headquarters at Atlanta, and with Mr. R. E. Dorer supervising operations in the State of Virginia. The first summer season of that campaign is now nearly ended and the article by Mr. H. H. Stage in the September issue of "Mosquito News" offers ample testimony as to the fine results achieved.

Such a malaria control offensive is of course aimed directly against the ANOPHELES QUADRIMACULATUS mosquito and as a result of its operations, in many areas where the QUADRIMACULATUS comprises the principal mosquito population, two objectives were served. Not only was the danger of spread of malaria largely eliminated but the personal annoyance from mosquito attacks was reduced. However, in other districts, especially urban areas and coastal sections, such as Norfolk, the present or potential mosquito population may be so large that ANOPHELES

family loses some of its importance by comparison of numbers, or when forced to compete with salt marsh SOLLICITANS and TAENIORHYNCHUS, ground pool VEXANS and COLUMBIAE, not to mention the domestic QUINQUEFASCIATUS and AEGYPTI, the QUADRIMACULATUS is really "traveling in fast company". This fact has already made itself evident among personnel of the Navy, most of whose bases have been established on strategic shore lines. Our own immediate vicinity offers a good example. AN. QUADRIMACULATUS loses nothing of its threat as a disease carrier but if we did not wage a constant war on its cousins and nieces and aunts and other family connections there would be a little blood left for the QUAD. to propagate upon. The salt marsh AEDES SOLLICITANS and A. TAENIORHYNCHUS comprise the most important element of the so called "pest" varieties here, on account of the enormous broods which are hatched in uncontrolled areas and the viciousness of their attack as well as the distances to which they will migrate. Either troops or workmen which are exposed to a barrage of SOLLICITANS during the otherwise peaceful quiet of a summer night lose something of their efficiency in physical and mental reactions just as surely as if they had donated a blood meal to the malarial parasite. A program of mosquito control does not play any favorites nor question too closely the past history or future intentions of its adversaries. As a mosquito, it is an enemy and a harmless CULEX APICALIS must suffer the same fate as the ANOPHELES QUADRIMACULATUS. But malaria control at present is designed along less stern lines and hesitates to move for extermination except where villainy has been proven. This seems a pity in cases where so much good could be accomplished at little extra cost.

An organization built only to combat AN. QUADRIMACULATUS on its usual home grounds would not contemplate the inclusion of a systematic inspection force such as is usually found so necessary to keep the urban mosquito problem in hand. Yet, as the direct result of systematic

work by our inspection crews this summer, more than 50 instances of heavy AN. QUADRIMACULATUS breeding were brought to light which otherwise would have continued to increase unhindered. The majority of these instances occurred in private fish ponds, Norfolk being cursed with great numbers of them. It is not exactly according to the rules for AN. QUADRIMACULATUS to breed freely in fish ponds - certainly not in such as are stocked with fish. Perhaps the war is responsible, but many rules seem to have been broken in Norfolk this summer for it was not uncommon to find prolific breeding in ponds both abandoned and stocked. From our point of view these AN. QUADRIMACULATUS were just as dangerous as if they had been bred and raised in some bosky dell or other more normal habitat. Nevertheless, they would have been missed completely by malaria control forces which lacked inspection crews.

There is also the AEADES AEGYPTI, which is found as far north as Norfolk. As a matter-of-fact we have it in great numbers and at times it has caused us some concern. Any attack against this species by malaria control at present would be quite ineffective since its domestic habits make close inspection and coverage of populous areas essential if its numbers are to be materially reduced. Our experience here has been that the most prolific breeding is usually found in the older and more densely settled sections of the city where also are found most of the floating and foreign population. Particularly under war conditions, with rapid shifting of both military and civil populations, often from distant outposts, the danger of carriers infected with yellow fever slipping through our medical defenses becomes greater than in peace times. Of course the Public Health Service is fully aware of such a danger and is ready to meet any emergency, but to the older residents of Norfolk, whose friends and relatives were victims of former epidemics, the fear of yellow fever is perhaps even more vivid. We consider the AEGYPTI a dangerous enemy whose potential threat is a serious one which must

be met by special planning and organized action.

It is unfortunate that the Public Health Service does not include in its malaria control program such further steps as might be necessary to restrict the birth rate of *Aedes Aegypti* to definite limits through our southern states. At present our Norfolk City mosquito control organization is carrying this burden alone. Specialists in all lines have become the rule rather than the exception. There is a doctor who is specially equipped to combat each type of illness which might attack the human system. He is highly trained, outfitted with the most modern instruments and fixtures and respected by the whole community. But the one man who is indispensable around there is the family doctor who has given relief at some time or other to every member of the family. Malaria control has done a wonderful specialist's job but mosquito control is still indispensable in many communities.

The Army and the Navy have both taken seriously the defense against the mosquito. Lieutenant S. C. Billings, formerly entomologist for twelve years with the Agricultural Marketing Administration, Department of Agriculture in Washington, has been assigned to the Army Medical Corps here and is developing a program to eliminate *Aedes sollicitans* and *A. taeniorhynchus* breeding which has developed heavily in Government made hydraulic fills where Army barracks have been established. Rain water lodging in depressions and shrinkage cracks offered ideal breeding conditions similar to those created widely hereabout during war construction and which have caused a good deal of local difficulty. Lieutenant Billings' efforts are being directed along lines parallel with those of our organization and it is hoped that widely beneficial results may follow.

Both the Navy and ourselves were fortunate in the assignment of Lieutenant Donald MacCreary to the Sanitary Corps at the Operating Base here. A member of the Eastern

Association on Mosquito Workers, Lieutenant MacCreary was an entomologist at Delaware University where he was an associate of Dr. L. A. Sterns who is now serving with the Army. The Navy's holdings in this Fifth Naval District are large and are still increasing. Construction of new bases as well as the enlargement of older ones has developed many and varied mosquito problems which have had to be handled under many different commands with a variety of equipment and personnel. Lieutenant MacCreary has done a remarkably fine job in coordinating the different efforts which all started from scratch and his enthusiastic energy and happy disposition have made it a pleasure for us to cooperate with him in every way possible.

Yes, war has put the finger on the familiar mosquito as a number one saboteur, but the combined efforts of the Army, the Navy, the Public Health Service and the City of Norfolk will make its life an uneasy one in this sector. To our many friends in the Public Health Service we extend congratulations on a malaria prevention job well done, but our experience in Norfolk leads us to believe that an "all-out" offensive is needed to bring fully satisfactory results. It is our hope that another year may see all mosquito enemies brought under attack.

A Suggested Treatment for the
Elimination of Surface Cracks
On Hydraulic Fills

William M. Thom
Engineering Inspector
Middlesex County Mosquito
Extermination Commission
Metuchen, New Jersey

Dr. J. S. Joffe and Dr. Victor A. Tiedjens of Rutgers University who recently made an inspection of the hydraulic fill at South Amboy, made the following recommendations as to the best means of eliminating the surface cracks on hydraulic fills composed mostly of clay and river silt.

First, the surface should be broken up into large lumps by means of a breaker plow. This should be done in the fall, preferably after the first frost when the soil will be firm enough to work on. By this means, air will penetrate the soil to a greater depth, thereby hastening the drying out process. At the same time, under the action of frost, the sodium chloride in the soil will be drawn to the surface of the lumps where it will leach in to the furrows, to be washed away by melting snow and the spring rains. If conditions permit, drainage ditches should be installed in such a manner as to intercept the furrows, in order to remove the surface water as quickly as possible.

After the spring rains have ceased, the ground should be thoroughly harrowed with a disc harrow, after which no further trouble should be experienced with surface cracks. However, if clay is the predominating ingredient, it may be necessary to repeat the process during the next season.

If it is desirable to prevent the growth of Phragmites (Fox Tail), about eight tons of Gypsum per acre should be added to the soil after which Red Top or other suitable grass, preferably one with creeping stems may be planted.

According to Dr. Joffe, the method outlined above has been used with considerable success in Holland, but is untried in this country as far as he knows.

Five Species of Mosquitoes, New to
New Jersey, Found in Last Five Years

John B. Schmitt,
Assistant Entomologist
New Jersey Agricultural
Experiment Station.

In the past few years five species have been added

to our New Jersey list. These species are: Aedes mitchellae (Dyar), Anopheles atropos D. & K., Anopheles walker¹ Theob., Theobaldia inornata (Will.) and Megarhinus septentrionalis D. & K.

The discovery of Anopheles atropos in New Jersey was announced by Dr. Leslie Stauber at the 29th Annual Meeting of the New Jersey Mosquito Extermination Association. The specimens were taken by Dr. Thurlow C. Nelson in Cape May County in 1928, and were identified by Dr. Nelson.

The very important finding of Anopheles walker¹ in New Jersey was made by Mr. Robert Vannote of Morris County at Pine Brook, N. J. on July 10, 1938. During the same month a single badly mutilated specimen of Megarhinus septentrionalis was submitted by Mr. O. W. Lafferty of Cape May County. A second specimen sent in by Mr. C. A. Doehlert was taken at Pemberton, N. J. on August 24th of that year. The identity of both the A. walker¹ and the M. septentrionalis specimens was established by Dr. Robert Matheson of Cornell University.

Mr. John Flynn of Passaic County brought in a single specimen of Theobaldia inornata in August, 1941. This specimen was identified by Dr. Alan Stone of the U. S. National Museum. A second specimen was trapped by Mr. Fred Reiley at Port Republic in August, 1942.

During the summer of 1941 Mr. Reiley reported the trapping of a specimen of Aedes mitchellae in Atlantic County. On April 27, 1942 Mr. T. D. Mulhern found a pupa of this species in a woodland pool near New Egypt. The emerged adult was checked by Dr. Alan Stone. Another adult of this rare species was trapped by Mr. Lester Smith at Camp Kilmer in August, 1942.

It is interesting to note that four of the five additions may be credited to county mosquito workers. With these new species, our list contains forty species,

as follows:

1. Aedes atlanticus D. & K.
2. Aedes atropalpus (Coq.)
3. Aedes aurifer (Coq.)
4. Aedes canadensis (Theob.)
5. Aedes cantator (Coq.)
6. Aedes cinereus Meig.
7. Aedes dupreei (Coq.)
8. Aedes excrucians (Walk.)
9. Aedes grossbecki D. & K.
10. Aedes implacabilis Walk.
11. Aedes mitchellae (Dyar)
12. Aedes sollicitans (Walk.)
13. Aedes sticticus (Meig.)
14. Aedes stimulans (Walk.)
15. Aedes taeniorhynchus (Wied.)
16. Aedes trivittatus (Coq.)
17. Aedes triseriatus (Say)
18. Aedes vexans (Meig.)
19. Anopheles atropos D. & K.
20. Anopheles barberi Coa.
21. Anopheles crucians Wied.
22. Anopheles punctipennis (Say)
23. Anopheles quadrimaculatus Say
24. Anopheles walkeri Theob.
25. Culex apicalis Adams
26. Culex pipiens Linn.
27. Culex salinarius Coq.
28. Culex territans Walk.*
29. Mansonia perturbans (Walk.)
30. Megarhinus septentrionalis D. & K.
31. Orthopodomyia signifera Coq.
32. Psorophora ciliata (Fabr.)
33. Psorophora columbiae (D. & K.)
34. Psorophora discolor (Coq.)
35. Psorophora ferox (Humb.)
36. Theobaldia inornata (Will.)
37. Theobaldia melanurus (Coq.)

38. Theobaldia morsitans (Coq.)
39. Uranotaenia sapphirina (O.S.)
40. Wyeomyia smithii (Coq.)

* The name Culex restuans Theob. is also in use for this species.

Fresno, California Begins Mosquito Abatement

Fresno, California mosquito abatement district first official day July 1, 1942, under leadership of superintendent Adolph Preuss, No. 3800, south 99 Highway, Fresno, California. Fresno mosquito Abatement District, PO Box 2, phone 4-4537.

New Trap Record Forms Developed

Certain readers of Mosquito News will be interested to know that at least two enterprising entomologists have made automatic light traps which make hourly collections of adult mosquitoes. These plans have been developed by Mr. C. M. Gjullin, Bureau of Entomology and Plant Quarantine, 438 U. S. Court House, Portland, Oregon, and Ensign William M. Gordon, Entomologist H-V(S) USNR, Corpus Christi, Texas. No doubt photographs and specifications of their respective traps can be obtained from these workers.

New types of record sheets, for larval collections and trapping records for the species encountered in Texas, have been developed by Ensign Gordon who, we believe, will send sample forms to anyone interested. The Tennessee Valley Authority also has record sheets for larval dippings, adult catches and weekly report of Malaria Control Activities which can also be obtained, we believe, by writing the Health and Safety Department of the Tennessee Valley Authority.

PUBLISHED ARTICLES OF INTEREST

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Essex County Offers a New Pamphlet

The Essex County (New Jersey) Mosquito Extermination Commission has just published an illustrated booklet "Why, This Pamphlet" for the purpose of acquainting its residents with a few of the common types of mosquitoes found in Essex County. The pamphlet gives a description of the four most important types of mosquitoes found in Essex County. Anyone desiring a copy of this pamphlet, may write to George W. Eager, Superintendent, Hall of Records, Newark, New Jersey.

Mosquito Light Traps Found Suitable
for Measuring Densities of Anopheles
quadrimaculatus

A Review by Dr. Thomas J. Headlee,
State Entomologist
Agricultural Experiment Station
New Brunswick, New Jersey

Stanley J. Carpenter of Camp Robinson, Arkansas, reporting in the Journal of Economic Entomology, Vol. 35, No. 4, August, 1942, in a paper entitled "Mosquito Studies in Military Establishments in the Seventh Corps Area during 1941" shows that the mosquito traps of the New Jersey type compared favorably with hand collection methods for measuring adult densities of Anopheles quadrimaculatus. Four species of mosquitoes, Anopheles quadrimaculatus, Culex quinquefasciatus, Aedes vexans, and Psorophora columbiae were present in sufficient numbers in Camp Robinson during 1941 to constitute a major problem. The peak in the production of A. quadrimaculatus in Camp Robinson and vicinity occurred during September. A total of 20 species of mosquitoes was taken during mosquito surveys in Army Camps in Missouri during the year. Specimens of Anopheles quadrimaculatus were obtained in each of these areas.

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From the Plainfield Courier News
Plainfield, New Jersey

Plain Talk

By Robert Quillen

You have read about the French Company that tried to dig a Panama canal and went broke because too many workers died. You have read how General Gorgas made the present canal possible by ridding the zone of malaria and yellow fever mosquitoes. And no doubt you have read the theory of scientists that malaria was the curse that destroyed so many ancient civilizations.

Ordinary malaria kills many people in our country every year and incapacitates several million more. Yet there are other forms of the disease even more deadly.

China has one of them. In one valley there are swarms of malaria mosquitoes whose bite is as deadly as that of the cobra.

Africa has another kind that kills or permanently disables nine of every ten who get it. A few years ago it was carried from Africa to Brazil, presumably by airplane, and threatened to depopulate the country. The Brazilian government, working with the Rockefeller Foundation, finally conquered it - but the job took millions of dollars and an army of workers spraying every puddle and every cow track in the infected areas.

America's native mosquitoes are carriers of several fatal diseases - diseases that kill dogs, chickens, sheep and horses as well as men.

Yet, experience has shown that scientists with money to spend can quickly control and eventually destroy the mosquitoes that are dangerous. They have done it in sections where mosquito swarms had almost destroyed property values, and what can be done for one neighborhood

can be done for the nation.

Knowing these things, we shall be criminally negligent if we do not prepare for a new kind of trouble more dreadful than any we have ever known.

The deadliness of Africa's malaria mosquito can scarcely be exaggerated. A scientist of the Rockefeller Foundation has warned us that one impregnated female liberated in the South could wipe out our civilization.

Do you doubt that any effort will be made to bring disease-carrying mosquitoes to our country? The Japs have already tried it in China. They are experimenting and learning.

Before this war ends - when the Germans and Japs begin to realize they cannot win - they will use every desperate and dastardly weapon that science can produce. Do you think them too humane to use disease germs?

Big officials will do nothing - and laymen will scoff - till it happens. But those who can had better be making plans to fight a new kind of enemy.

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An Account of the 1942

Malaria Epidemic in India

By Sonia Tomara

New York Herald Tribune

In addition to the political and economic difficulties it has to fight today, the Indian government is confronted with a malaria epidemic which is taking hundreds of thousands of lives. It is interfering seriously with harvesting the rice and millet that now are ripe, and with work in the factories. In some villages around Delhi one in every four persons is stricken. This, I believe, is the most severe epidemic in years, and is

aggravated by the sudden stoppage of quinine imports.

The production in the United States of drugs to take the place of quinine is considered here to be one of the most important medical achievements of war. I began to hear about malaria as soon as I arrived here, but hesitated to write about it until I had all the data. It came in dribblets from official and unofficial circles.

The epidemic usually recurs every seven years. This time it waited nine years. The monsoon had been exceptionally long and the rains abundant, so that the rivers left their beds and flooded the plains of Punjab, Sind, Delhi and the United Provinces of Bihar, Bengal and Assam. In normal years 100,000,000 cases of Malaria are treated in all India and 1,000,000 persons die from it.

Higher Death Toll Expected

This year the figures are expected to be much higher. When the rains stopped the heat returned and the swollen streams receded, leaving vast marshy surfaces, which are ideal for breeding mosquitoes. The epidemic will last another month.

Ninety-seven per cent of the quinine usually consumed in India came from Java, and only 3 per cent is grown here in the Madras and Bengal provinces. Twenty-five tons of the existing stock have been taken over for the Army, leaving seventy-five to ninety-five tons for civilian use. The doctors complain of the shortage and inefficacy of the quinine.

The price of quinine, which a year ago was three rupees eight annas (\$1.15) for 100 tablets, has jumped to twelve rupees six annas, almost four times as much. Much of the drug has been withdrawn from the stores and

sold in the black market at much higher prices. One tablet of atabrine, which is now considered more effective than quinine for a complete cure, costs 15 cents. Both prices cannot be paid by the poor, and it is the peasants living in the plains who suffer most.

In former times quinine was sold at a fair price at the village post-offices, but it has disappeared. To spread the existing stocks over a longer period it was planned to reduce the consumption of quinine by 25 per cent. It is no longer given as a prophylactic measure, except to troops who receive treatment before going to the front and again on their return.

Blow to Medical Authorities

The fall of Java has been a great blow to Indian medical authorities. Twelve hundred acres now have been planted in India with cinchona trees, which in three years will be old enough to be stripped and to yield nearly 42,000 pounds of quinine. It has been decided to adopt the Russian method of letting the seedlings grow for three years before stripping the bark. This differs from the method used in Java where only the bark of seven to twelve-year-old trees was used. Even after three years, quinine production here will be insufficient.

An order has been placed in the United States for 28,000,000 tablets of a synthetic drug called mepacrine and in Britain for 15,000,000 tablets of pamiquin. The American drug is coming at the rate of 1,000,000 tablets a month and the British 100,000 monthly. The Army will be supplied first. Little can be done under present conditions for the villages where the death rate is high. The fear of death is accepted by Indians with resignation as part of the karma, or fate imposed by previous incarnations.

An Excerpt From an Article
"U. S. Air-Route Bases in Africa
Give American Tinge to Wilds"

From the New York Herald Tribune
October 11, 1942

Buildings in the camp are of concrete-block construction, screened and with screen porches. Some of the personnel are quartered in tents, but every one sleeps under a mosquito net. Although this camp is in a malarial section and on the edge of a tsetse fly belt, health conditions are good. There is a water purifying system; food is prepared under strict medical supervision, and forty miles of ditches have been dug to drain off water which otherwise would provide breeding places for malaria mosquitoes.

During the day time the personnel wear either shorts or long trousers, shirts and sun helmets. In the evening each man puts on his mosquito boots and long trousers. The mosquito boots are of light leather and reach up over the calves. Mosquitoes in this section are active at night and are said to remain close to the ground, hence the boots. Each man takes his five grains of quinine daily. There is a bottle of quinine tablets on each table in the mess halls, and most seem to prefer to take it with the evening meal.

Englishmen in this country, who look upon an occasional attack of malaria as a matter of course, are surprised at the elaborate health precautions of the Americans. When engineers began work on the route last fall, one out of three men came down with malaria. Now it has been reduced to hardly more than 1 per cent in the periodic check-ups.

Mystery Fever at Fort Bragg

From the New York Sun

November 13, 1942

Civilian volunteers will be called as guinea pigs to help determine the origin of a mysterious, although just now dormant, disease in an American Army camp, the Southern Medical Association was told today.

Lieut. Col. Worth P. Daniels of Fort Bragg, N. C., said that forty soldiers there had been stricken by a strange rash-accompanied fever. There were no deaths.

He said a mosquito known as *Aedes aegypti* was among suspects listed as transmitters of the disease. Some of these were fed on two men during the early phase of their illness and an attempt is to be made to transmit the disease by these mosquitoes for observation.

Lieut. Col. Daniels said since September there had been no cases of the disease, which had been called pre-tibial fever because the rash occurs on the front of the legs.

He said the fever lasted about five days and was accompanied by low respiratory manifestations, pain in the forehead and behind the eyes, backache, reduction in white blood cells, enlargement of the spleen and the rash.

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PERSONAL NOTES

The latest word from John W. Scott, formerly of Union County, N. J. is that he received a promotion and is now a captain. Captain Scott is at Fort Custer, Mich.

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Fred W. Rush, Superintendent of the Solano County, California, Mosquito Abatement District since its organization in 1930, died in February, 1942. His practical development of the idea of controlled re-flooding and re-draining was a substantial contribution to mosquito control technique.

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Mr. Harry B. Demas, Foreman and Machine Operator on the Four County Committee, Passaic River Channel Reclamation for mosquito control, was drafted into the U. S. Army on November 6. Mr. Demas is now stationed at Fort McClellan, Alabama.

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EDITORS NOTE:

The shortage of personal notes is due to lack of contributions, rather than news, because there must be many changes in location and positions of our friends and co-workers which other readers would like to be informed about. The Committee will welcome any news as to the positions and whereabouts of mosquito control workers.

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